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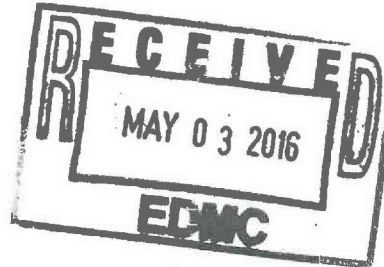
STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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April 27, 2016

16-NWP-077



Mr. Michael W. Cline, Federal Project Director
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: A5-11
Richland, Washington 99352

Re: Department of Ecology's (Ecology) Response to the draft Evaluation of 200 West Pump and Treat on Groundwater Monitoring for Trenches 31 and 34, SGW-59564, Rev. 0 Report

Reference: Letter 15-NWP-157, dated August 13, 2015, to S. L. Charboneau, USDOE-RL, and J. Ciucci, CHPRC, from S. Dahl, Ecology, "Groundwater Monitoring Requirements for Low-Level Burial Grounds Trenches 31/34 Permit Modification to the Hanford Facility Resource Conservation and Recovery Act Permit, Dangerous Waste Portion, Revision 9, for the Treatment, Storage, and Disposal of Dangerous Waste"

1230858

Dear Mr. Cline:

Ecology requested the United States Department of Energy – Richland Operations Office (USDOE-RL) provide an Engineering Report to support a new Groundwater Monitoring Plan for Operating Unit Group, Trenches 31 and 34, in the above referenced letter. USDOE-RL presented information to Ecology staff on December 8, 2015, in response and provided a draft report. Enclosed are our detailed comments on the draft report and a summary of our key concerns below:

1. The point of compliance is an issue, as 299-W10-29 and 299-W10-30 wells are not located at the down-gradient point of compliance under Washington Administrative Code (WAC) 173-303-645. Ecology has no basis to support a deviation from the regulations regarding wells at the point of compliance.
2. Groundwater flow direction is affected by the pump and treat, which is why there is now water in one of the two down-gradient wells. Water is present in the well because of a nearby injection well that has caused an increase in the water level. CH2M HILL Plateau Remediation Company claims that it is groundwater, but it is not natural groundwater unless proven that dilution is not affecting the quality of the water. The effect of the pump and treat on groundwater chemistry is highly uncertain. As a result the background chemistry in up-gradient wells may not be representative.
3. The process presented in the December meeting seemed to be valuable, but Ecology would want to study it more. It was not clear if groundwater chemistry evaluation was part of the process. The analysis appeared to be strictly a flow solution, and not a transport solution. We will not be able to provide a quick decision based on a presentation.



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4. Use of a site and local evaluation model should be consistent with the broader aspects of the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) model for groundwater. Give an explanation of how the model you are using is going to meet the Engineering Report objectives and will not provide results contrary to those in the TC&WM EIS. In addition, the local model should have sufficient spatial resolution to accurately represent complex groundwater flow in the vicinity of the injection well and trenches. Ecology is also not sure what was done with dispersivity and what value(s) were used. Evaluate longitudinal and transverse dispersivity to understand how mixing is taking place in both the up-gradient and down-gradient locations.
5. Evaluate the use of direct measurement of groundwater flow in the immediate vicinity of the units. Show that there is, or is not, mixing of injected water and groundwater occurring and provide a detailed technical basis for that conclusion.

An Engineering Report along with the resulting updated Groundwater Monitoring Plan will be part of the Permit Application, for Operating Unit Group, Trenches 31 and 34. This Engineering Report must address the requirements presented in our letter and our review of your draft report shows it does not.

The Engineering Report will be used as a template for other sites and situations where pump and treat systems have affected the present groundwater monitoring networks. These effects may be either by dilution close to injection wells with resulting changes in groundwater flow direction near extraction wells, or a change in water table (e.g., a drop that leaves wells dry, change in flow direction) that may or may not be the result of a pump and treat system. Each system affected will need to be evaluated by an Engineering Report, as required by WAC 173-303-806(4)(a)(xx), based on site specific information.

Ecology would like to meet with you and your staff to resolve the comments presented in the enclosure. We request you provide an update draft that incorporates our comments for our review to assure Ecology that you will have a complete permit application when you provide it with the Groundwater Monitoring Plan. We would like to see that draft no later than June 30, 2016, in order to support the unit application review. This area (Engineering Report) of the application has been reviewed and deemed incomplete. Please provide a schedule for completion and submission of the revised Groundwater Monitoring Plan with that submission in June.

If you have any questions, please contact me at cheryl.whalen@ecy.wa.gov or (509) 372-7924.

Sincerely,



Cheryl L. Whalen
Cleanup Section Manager
Nuclear Waste Program

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Enclosure

cc: See page 3

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cc electronic w/enc:

Dave Bartus, EPA
Dennis Faulk, EPA
Stacy Charboneau, USDOE
John Ciucci, USDOE
Cliff Clark, USDOE
Bill Faught, USDOE
Mostafa Kamal, USDOE
Jon Perry, MSA
Ken Niles, ODOE
Debra Alexander, Ecology
Jeff Ayres, Ecology
Joe Caggiano, Ecology
Dwayne Crumpler, Ecology
Dib Goswami, Ecology
Zelma Jackson, Ecology
Stuart Luttrell, Ecology
Nina Menard, Ecology
Deborah Singleton, Ecology
Ron Skinnarland, Ecology
John, Temple, Ecology
Kim Welsch, Ecology
Environmental Portal
Hanford Facility Operating Record
USDOE-RL Correspondence Control

cc w/enc:

Steve Hudson, HAB
Administrative Record
NWP Central File

cc w/o enc:

Rod Skeen, CTUIR
Gabriel Bohnee, NPT
Alyssa Buck, Wanapum
Russell Jim, YN
NWP Reader File

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Document Number(s)/Title(s): SGW-59564. Rev. 0, Evaluation of 200 West Pump and Treat on Groundwater Monitoring for Trenches 31 and 34	Program/Project/Building Number:	Reviewer:	Organization/Group:	Location/Phone:
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Comment Submittal Approval:

Agreement with indicated comment disposition(s)

Status:

Organization Manager (Optional)

Date

Reviewer/Point of Contact

Date

Reviewer/Point of Contact

Author/Originator

Author/Originator

Item	Page# Section # Line #	Comment (s)	Hold Point	Disposition (Provide justification if NOT accepted.)	Status
1.	General	This document does not meet the critieria established in WAC 173-303-806(4)(a)(xx) to meet requirements in WAC 173-303-645(8). It only addresses one aspect of the engineering report related to how pump and treat will affect groundwater monitoring for dangerous waste constituents. It does not justify the number of wells, locations, etc.			
2.	General	The title does not specify that this is an "Engineering Report (or Engineering Evaluation as required by 173-303-806(4)(xx)(E))." If this is an engineering report or engineering evaluation then the title should state so.			
3.	General	WAC 173-303-806(4)(a) requires that the study must be certified by a registered professional engineer. This document does not mention that it was prepared or certified by a registered professional engineer. The document must state such otherwise the reader cannot determine if it was properly certified.			
4.	General	Provide all methodologies used in this document (e.g., DQO method, groundwater elevation kriging,			

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		computer codes and models, QA/QC in the information on the models and data).			
5.	General	Nowhere in any section or throughout the document are the "how, what, who(se), why, when, which and where" questions adequately discussed.			
6.	General	After reading this document thoroughly several times, I have been only able to ascertain that the 2 existing wells, W10-29 and W10-30, should be able to successfully detect releases from Trenches 31 and 34. Unfortunately, this document misses one of the largest reasons for requiring the engineering report. There is no verification or substantiation that these well locations are the ideal locations for the down gradient wells. This report needs to fully document that these locations are the best locations for down gradient monitoring wells. A detailed engineering analysis must be included to demonstrate that these locations are the ideal locations and not just because these wells already exist. This same analysis should be performed for the existing well W10-31.			
7.	General	There has been a long time contention that the down gradient wells MUST be installed at the point of compliance in accordance with WAC 173-303-645(6). There is no discussion on the placement of the wells at the point of compliance or any discussion as to why wells cannot be placed at the point of compliance. This report must provide engineering documentation as to the best location of the wells. If the point of compliance is not the best location for the wells, then an engineering analysis must be included. Also, in this case, the point of compliance is at the edge of trenches 31 and 34 and not the boundary of LLWMA-3.			
8.	General	The same analysis must be performed for the proposed			

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		new well(s).			
9.	Pg 7, 2 nd sentence	Typo: The sentence should read "This study is performed..."			
10.	p. 7, Sec. 1.1, 2 nd para.	Documents are cited (SGW-47729-VA) that are not in the AR, but need to be further discussed in this document and available to the public that support this document. All documents that support the purpose, methodology, location for this support the permit.			
11.	p. 7, Sec. 1.1, 1 st and 2 nd para.	The paragraph discusses how it meets "interim status requirements," yet this document was written to support "final status of Trench 31 and 34." Final status requirements in WAC 173-303-645 and WAC 173-303-806(4)(a)(xx) need to be discussed and appropriately resolved to be met. This document does not accomplish this objective.			
12.	Pg 9, 1 st sentence	Spell out CCU or put it in the Terms section on page v.			
13.	Pg 9, 1 st para. and General Comment	There is no Figure 2-4. Note: it is apparent that the large number of typos and errors throughout the document indicates that the document has not been proof read by a technical editor.			
14.	General Comment	There is no stratigraphic column in the document. Please provide a site specific stratigraphic column and not the generalized Hanford stratigraphic column.			
15.	p. 9, Sec. 2, 1 st para.	Provide what unit the unconfined aquifer resides and the particular information of this "local confining layer" "just at the water table."			
16.	p. 9, Sec. 2, 1 st para.	Provide what units exist at the base of the Ringold Unit E. Provide if Unit A or the basalt is the base of the aquifer. Provide if the basalt is flow top or brecciated. Provide what hydrogeologic information is known about the geology. More information is needed. As required by WAC 173-303-645(8), the			

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		hydrogeology of the DWMUs is needed in this engineering report and is not provided. A stratigraphic column is not even provided. Provide cross-section and other pertinent information to understand the geology/hydrogeology of these dangerous waste management units.			
17.	p. 9, Sec. 2, 1 st para.	No Figure 2-4 exists in this document.			
18.	p. 9, Sec. 2, 2 nd para.	This paragraph repeats the same two sentences with a different hydraulic gradient. Provide when these hydraulic gradients represent. Eliminate the remainder of the sentences. This clearly shows no peer review or technical editing was conducted for this document. It is filled with redundancy and plagurism that is not cited. Provide what year the average flow rate is calculated. It is different on p. 10.			
19.	p. 9, Sec. 2, 3 rd para.	Provide a date when "flow direction has returned to the pre-Hanford east or east-northeast.			
20.	p. 9, Sec. 2, 3 rd para.	Provide if the SALDS has affected the water table (i.e., raised the water level) around LLWMA-3.			
21.	p. 9, Sec. 2, 3 rd para.	Provide a date when disposal ceased at T Pond and U Pond. According to other documents, this stopped in the mid-1990s not 1970s. U Pond was in operation until 1985.			
22.	p. 9, Sec. 2.1	Provide what the groundwater elevation represents where the RLM is absent under no P&T remedy.			
23.	p. 9, Sec. 2.1	Provide the methodology in this document as described in SGW-42305.			
24.	Pg 10, 1 st para.	There is no Figure 2-5 as stated in the 1 st sentence.			
25.	p. 11, Sec. 3, 2 nd para.	Provide supporting documentation for the statement, "It is unlikely that any of the LLWMA-3 monitoring wells will go dry because injection wells have raised			

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		the water table.” Explain what will happen when pumping ceases. Provide how much the water table has risen. Provide how this rise compares to during T Pond operations. Discuss if SALDS has risen the water table in relation to the rise from the “injection wells.” Provide all this information in THIS document and the proposed groundwater monitoring plan document..			
26.	p. 13, Table 4-1.	Provide what IW represents.			
27.	p. 13, Table 4-1.	The Ecology presentation on LLBG-Trenches 31/34 Groundwater Monitoirng (SGW-59566-VA) indicated 2000 gpm was used not 1900 gpm. Provide/clarify what is the correct value used and provide supporting information why this value was selected besides “current conditions.” Based on the discrepancy it is difficult to understand what “current conditions” represents. Provide the overall flow map of the treatment facility including wells (i.e., a full list of pumping rates). Supporting information is severely lacking in this document.			
28.	p. 13, Table 4-1.	Provide what the injection rate into wells 299-W10-35 and 299-W10-226 are.			
29.	Fig 5-1	These should be individually labeled. The figure number is not shown until the reader is on the 4 th page of the figures.			
30.	Figure 5-1	Please provide a location diagram of the wells in the figures. They are not shown on Figure 1-1 and Figures 2-1 and 2-2 are too busy and blurry to be of any value.			
31.	General comment	In 10/2014, WIDS site 200-W-254 was created to represent the two active RCRA trenches. The 218-W-5 represents the inactive portions of the burial grounds. Please explain how this is represented in this report,			

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		specifically the boundary of 200-W-254 as it relates to the MW trenches and monitoring well location.			
32.	p. 13, Sec. 4.1, 1 st para.	Provide the flow rates (injection rates) for the two wells. The statement "The flow rates to the two injection wells for cases A-E are provided in Table 4-1" is incorrect. A percentage is given, but I doubt that 1000 gpm is being injected into each well or 2000 gpm is being injected. In addition the Cases are from A-F, not A-E.			
33.	p. 14, Sec. 4.1, 2 nd para.	Provide when the shutoff date is expected on the model run. Provide more detailed information on each alternative to understand its overall effect.			
34.	p. 14, Sec. 4.2	Various computer programs and processes are inadequately explained. Provide how many samples were collected, provide the raw data in tables, provide the monthly average for the process. Provide more information to the overall process to achieve "Water Level Mapping and Particle Tracking". Discussion of 3-day time windows and 2-day time windows is very confusing. Provide why median values were used versus mean average. Provide why compared to the "bottom of the well." Provide which one was used "land surface" or "measuring point reference elevation". This could be a greater than 3 feet difference.			
35.	p. 14, Sec. 4.2	Provide if this "monthly-averaged data" is median average or mean average. I assume it is median average data based on the information provided.			
36.	p. 14, Sec. 4.2	Provide in this document the "monthly groundwater elevation maps for the upper unconfined aquifer above the RLM in the vicinity of the LLWMA-3." Is there a confining or uppermost confining aquifer?			
37.	p. 14, Sec.	KT3D-H@) program is never defined or discussed to			

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	4.2	address its QA/QC information.			
38.	p. 14 Sec. 5	Provide if the "most recent model package report" was used for this document or was it done in 2014.			
39.	p. 15, Sec. 5, 1 st para.	Provide a better explanation of the "Simulated groundwater elevations using the CPGWM. This is detailed oriented information that is not provided adequately in this paragraph. It is redundant in places. Provide/Explain how "hydraulic containment" works in context to this paragraph and the two bullets.			
40.	p. 15, Sec. 5, 2 nd para.	Provide how the calibration change in 2015 applied to data collected in 2014. Provide when the calibration started. Provide when the calibration period ended. Provide where (geographic area) the calibration is being conducted. Provide what it is being calibrated to meet. The methodology is confusing, because here it states one year of data, yet manual data over a 5 year period was used. Provide how calibration, validation, verification, and QA/QC was used to conduct flow model results using water level measurements.			
41.	p. 15, Sec. 5, 2 nd para.	Provide what "Daily average water level values were calculated for incorporation into the validation-calibration data set." Provide the time period of these "daily average" values. Provide if the calibration included data from 2009 through 2014 or just one year (2014).			
42.	p. 19, Sec. 6, Pathline Bullets.	Provide for how long particles were released. Provide what the release rate was.			
43.	p. 19, Sec. 6, Pathline Bullets.	Provide how the different concentration units from the various release points were tracked to ensure QC. Provide why tracking was stopped at 2037. It would appear one would want to know what happens after pump and treat is turned off. Provide when the			

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		concentration releases began. Provide when tracking stopped.			
44.	p. 20, Sec. 6.1, 2 nd para., editorial and 3 rd para.	Change 299-W10-30 to 299-W10-29 to read, "...dilution influence to monitoring wells 299-W10-30 and 299-W10-29. However,..." and in 3 rd para, last sentence, "dilution at monitoring wells 299-W10-30 and 299-W10-30." Change to 299-W10-29 for the last well listed.			
45.	p. 20, Sec. 6.1, 3 rd para.	It needs to be clear what is being compared; as written, the reader has to read the 2 nd paragraph and understand that the author is still using the same comparison that was established in that paragraph. Provide a sentence in this paragraph that establishes that the comparison is being made with Case A as the base case or comparison case, yet A provides for a dilute value as well as all the other cases. It is not clear what the "true base case" for comparison should be for each well.			
46.	p. 20, Sec. 6.1, 3 rd para.	Provide the fact that dilution occurs in all cases. For a release, the initial concentration would be reduced between 15 to 95 percent depending on well location and case A-F.			
47.	p. 22-23, Sec.6.2	Based on what is written I do not understand what is being communicated. I get different values for percent difference and factors than provided. Rewrite this section clearly and concisely to understand what is being communicated. Provide whether the pump and treat injection wells make the release diluted. Based on the values provided, a release of 1 mg/L would equal .07 mg/L of concentration. It cannot be determined if the flow pathlines would further dilute this concentration or if this is the concentration accounting for dilution.			

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48.	p. 23, Sec.6.2	Provide what is meant with the terms, "critical point" and "common default values for the dilution contour range from 0.1 to 0.001. Clearly 0.07 falls within this range. This is 10% to 0.1%.			
49.	p. 28-34, Sec. 6.3	Same comments that apply to Scenario 1 apply to Scenario 2.			
50.	p. 31, Figure 6-14	This graph is missing Scenario 2-F. Provide Scenario 2-F in this graph.			
51.	p. 34, Sec. 6.4	Provide if this is 10 to 25 years after shutting off the pump and treat in 2037 representing the timeframe of 2047 to 2062. Provide which case represents the pre-existing conditions before the pump and treat is turned off. Provide if this is based on Case 1A or 2A or some other case/scenario.			
52.	p. 35, Sec. 6.5	Provide by how much time releases are shortened based on pre-P&T remedy conditions. The pre-remedy P&T were never presented in this report that this reviewer noticed.			
53.	p. 35, Sec. 6.5	The results indicated with certainty that a release would be detected. In this summary section it states, "The dilution influences from the injection wells are not anticipated to adversely impact detection of releases at the monitoring well." Besides being poorly written – "anticipated" does not convey with clarity that a "detection of a release" would occur. Based on the presented values ranging from 32% to 7% of a unit concentration release. This would range between 0.32 to 0.07 mg/L for an analyte with a concentration of 1 mg/L. Depending on the analyte and its associated method detection limit, most constituents would not be detected at the lower dilution factors of a release.			
54.	p. 35, Sec. 6.5	At the very end of the summary "two additional monitoring well locations (299-W10-13 and 299-W10-			

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		<p>20) is recommended for the monitoring well network to provide increased monitoring robustness in response to possible adjustments to the 200-W P&T pumping rates” with no clear justification. One of these wells is dry. Provide a full detail discussion and then further analysis of these wells for adding them into the system. Provide why we need more robustness, how they will perform, where they are in regard to location and when do they need to be added to the system. DOE/RL-2015-64, Decisional Draft submitted in December 2015 as part of the Trench 31/34 groundwater monitoring plan indicates that well 299-W10-13 is dry. Explain why in this report and in the proposed final status groundwater monitoring plan (DOE/RL-2015-64) placing a dry groundwater monitoring well into the permit process is reasonable. Provide a thorough report/plan that indicates a replacement well and its location with supporting analyses.</p>			